

Claims

1. Method for enhanced acknowledgement / non-acknowledgement signaling applicable to automatic repeat request mechanisms operable with a sender of data packets in wireless networks, wherein said signaling comprises a number of ACK/NACK messages for being transmitted on a time-multiplexed channel being partitioned into transport time intervals (TTIs), said method comprising:
 - defining a number of j_{\max} shares within each transport time interval (TTI), wherein each share has a predefined extent in time; and
 - transmitting each ACK/NACK message within a predefined selection of shares, wherein a total extent in time of said predefined selection of shares corresponds to an extent in time of said transport time interval (TTI).
2. Method according to claim 1, which comprises a first stage comprising:
 - transmitting each ACK/NACK message within each shares defined within one transport time interval (TTI).
3. Method according to claim 1, which comprises a second stage, wherein said number of j_{\max} shares corresponds to a number of n ACK/NACK messages, which are to be transmitted within one transport time interval (TTI).
4. Method according to claim 1, which comprises a third stage, wherein said number of j_{\max} shares corresponds to a multiplicity of said number of n ACK/NACK messages to be transmitted within one transport time interval (TTI), said method comprising:
 - transmitting said number of n ACK/NACK messages distributed upon said number of j_{\max} shares within said transmission time interval (TTI).
5. Method according to claim 4, wherein said number of j_{\max} shares corresponds to an even multiplicity of said number of n ACK/NACK messages, said method comprises:
 - transmitting said number of n ACK/NACK messages distributed evenly upon said number of j_{\max} shares within said transmission time interval (TTI).
6. Method according to claim 4 or claim 5, wherein said number of n ACK/NACK messages are distributed upon said number of j_{\max} shares in accordance with a round-robin method.

7. Method according to anyone of the preceding claims, wherein each of said ACK/NACK messages indicates to said sender whether a data packet previously transmitted has been decoded successfully or not by a receiver of said data packets.
8. Method according to anyone of the preceding claims, wherein an interleave length for the transmission of a particular ACK/NACK message results from the total extent in time of an interval starting with a first TTI including said particular ACK/NACK message within at least one share and ending with a second TTI including said particular ACK/NACK message within at least one share.
9. Method according to anyone of the preceding claims, wherein said predefined extents in time of said shares correspond to each other.
10. Method according to anyone of the preceding claims, wherein said sender is a mobile terminal.
11. Method according to anyone of the preceding claims, which is applicable to enhanced uplink data access operable with the universal mobile telecommunication system, wherein said universal mobile telecommunication system operates in the frequency division duplex domain.
12. Method for enhanced acknowledgement / non-acknowledgement signaling applicable to automatic repeat request mechanisms operable with a sender of data packets, wherein said signaling comprises a number of ACK/NACK messages for being transmitted on a time-multiplexed channel being partitioned into transport time intervals (TTIs), said method comprising:
 - receiving within at least one transport time interval being partitioned into a predefined number of shares at least two ACK/NACK messages; and
 - combining said ACK/NACK messages received in said predefined number of shares to obtain said at least two ACK/NACK messages.
13. Computer program product for enhanced acknowledgement / non-acknowledgement signaling, comprising program code sections for carrying out the steps of anyone of claims 1 to 12, when said program is run on a controller, processor-based device, a computer, a microprocessor based device, a terminal, a network device, a mobile terminal or a mobile communication enabled terminal.

14. Computer program product for enhanced acknowledgement / non-acknowledgement signaling, comprising program code sections stored on a machine-readable medium for carrying out the steps of anyone of claims 1 to 12, when said program product is run on a controller, processor-based device, a computer, a microprocessor based device, a terminal, a network device, a mobile terminal, or a mobile communication enabled terminal.
15. Software tool for enhanced acknowledgement / non-acknowledgement signaling, comprising program portions for carrying out the operations of any one of the claims 1 to 12, when said program is implemented in a computer program for being executed on a controller, processor-based device, a microprocessor based device, processing device, a terminal device, a network device, a mobile terminal, or a mobile communication enabled terminal.
16. Computer data signal embodied in a carrier wave and representing instructions, which when executed by a processor cause the steps of anyone of claims 1 to 12 to be carried out.
17. Device for enhanced acknowledgement / non-acknowledgement signaling applicable to automatic repeat request mechanisms operable with a sender of data packets, wherein said signaling comprises a number of ACK/NACK messages for being transmitted on a time-multiplexed channel being partitioned into transport time intervals (TTIs), wherein a number of j_{\max} shares is defined within each transport time interval (TTI), wherein each share has a predefined extent in time, said device comprising:
 - a transmitter, which is adapted to transmit each ACK/NACK message within a predefined selection of shares, wherein a total extent in time of said predefined selection of shares corresponds to an extent in time of said transport time interval (TTI).
18. Device for enhanced acknowledgement / non-acknowledgement signaling applicable to automatic repeat request mechanisms operable with a sender of data packets, wherein said signaling comprises a number of ACK/NACK messages for being transmitted on a time-multiplexed channel being partitioned into transport time intervals (TTIs), said device comprising:
 - a receiver, which is adapted to receive within at least one transport time interval being partitioned into a predefined number of shares at least two ACK/NACK messages; and
 - a message handler, which is adapted to combine said ACK/NACK messages received in said predefined number of shares to obtain said at least two ACK/NACK messages.